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10/676,377	09/30/2003	Ulrich Neumann	06666/156001/USC-3345	3241

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EXAMINER	
AMINI, JAVID A	

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2628	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/676,377	NEUMANN ET AL.	
	Examiner	Art Unit	
	JAVID A. AMINI	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25,29-31,33,37-39 and 41-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25,29-31,33,37-39 and 41-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/13/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Arguments

Applicant's arguments filed 3/13/2008 have been fully considered but they are not persuasive.

In response to Applicant's argument (on page 9 in first paragraph) that the reference Sawhney does not state the video information is projected on to such models, Contrarily, Sawhney teaches clearly in fig. 8d, see model red lines. On pages 9-10, Applicant argues that Sawhney does not describe, placing a surface that corresponds to a moving region in a three dimensional model, Examiner believes Sawhney e.g., in fig. 9 illustrates a moving region (a moving aerial) in a 3-D model e.g., using model lines in fig. 8d.

In response to Applicant's argument on page 10 in second paragraph the reference's technique described a moving object uses stereo cameras, and this is in sharp contrast with the claimed invention, which can be employed using a single camera. Examiner's reply: in light of the specification e.g. in fig. 10 illustrates at least three cameras.

Examiner's notes: Applicant my point out where is the limitation of using only a single camera in the claims?

In response to Applicant's argument on page 11 in first paragraph, regarding Arpa the reference that used in previous office action dated 5/4/2005, It is noted the current reference is "Sawhney" based on office action dated 11/13/2007.

Examiner's suggestion: Applicant is encouraged to schedule an interview.

Further down on the same page, Applicant argues the reference does not indicate that the threshold is histogram based or that a noise filter is used. Examiner points out to e.g., page 164 at the right col. teaches the absolute value at each point can then be computed, and the result can be

thresholded in order to highlight intensity or feature differences between the current video image and the reference image, on page 160 in fig. 3 clearly illustrates final rendered composite that has been filtered the video pixels.

On page 12 Applicant indicated, is not understood the Examiner interpretation that the noise filter may be considered as a virtual camera view in fig. 3 that shows just the video pixels; wherein identifying a region in motion in real time further comprises estimating the background image by modeling the background image as a temporal pixel average of five recent image frames in the real-time video imagery information (e.g., on page 164 at right col. teaches the reference background image needs to be constantly updated during the day to reflect changing ambient illumination. Alternatively only moving objects may be detected by comparing current image with an image taken a few seconds before. The 2D moving object detection can be done in real time, also see page 162 left column at third paragraph). On the other hand, comparing fig. 15 of the current invention with fig. 10 of the reference: in fig. 15 steps 1500, 1510, 1520, and 1530 illustrate what is shown the left side of fig. 10, and fig. 10 illustrates the validated foreground object in step 1550 in the middle of fig. 10.

Examiner's notes: Applicant's arguments do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections.

Based on mentioned reasons above, the previous rejection is still maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 25, 29-31, 33, 37-39, and 41-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over H. S. Sawhney, et al. with title of "Video Flashlights – Real Time Rendering of Multiple Videos for Immersive Model Visualization", hereinafter Sawhney, see cited PTO-1449 dated 8/6/07.

Claim 29.

A method comprising: Sawhney teaches obtaining a three dimensional model of a three dimensional environment (e.g., under section 2 on page 158 in the third paragraph), the three dimensional model generated from range sensor (e.g., left col. line 5 on page 165), information representing a height field for the three dimensional environment (e.g., a range finder device); identifying in real time a region in motion (e.g., the video sequence shown moving objects in fig. 10) with respect to a background image (e.g., in fig. 10 see the background image) in real-time video imagery information from at least one image sensor having associated position and orientation information with respect to the three dimensional model (e.g., in fig. 10 see 3D change image), the background image comprising a single distribution background dynamically

modeled from a time average of the real-time video imagery information (e.g., in fig. 10 illustrates the background image and a video sequence, on page 167);

Sawhney is silenced explicitly specify (see underlined, below) placing a surface that corresponds to the moving region in the three dimensional model (e.g., in fig. 10 illustrates moving objects), wherein placing the two dimensional surface comprises: casting a ray (Examiner's note: casting rays are: cast and traced *in groups* based on some geometric constraints, and each ray is traced *separately,* so that every point (usually a pixel) on the display is traced by one ray.) from **an optical center**, corresponding to the real-time video imagery information, to a bottom point of the moving region in an image plane in the three dimensional model; and determining a position, an orientation and a size of the two dimensional surface based on the ray, a ground plane in the three dimensional model, and the moving region (e.g., in fig. 10 illustrates a 3D model, and a moving region). Projecting the real-time video imagery information onto the three dimensional model, including the surface, based on the position and orientation information (e.g., in fig. 10 illustrates moving objects); and visualizing the three dimensional model with the projected real-time video imagery (e.g., in fig. 10 illustrates moving objects); wherein identifying a region in motion in real time comprises subtracting the background image from the real-time video imagery information (e.g., in fig. 10 illustrates on the right and left sides of the figure), identifying a foreground object in the subtracted real-time video imagery information, validating the foreground object by correlation matching between identified objects in neighboring image frames, and outputting the validated foreground object (e.g., in fig. 10 illustrates outputting the foreground object vs the background image at the right side of the figure);

However, Examiner believes Sawhney teaches the optical center in fig. 4 that corresponds depicting occlusion handling for rendering a video flashlight camera and the model from a virtual viewpoint, because it would have been obvious to an ordinary person skill in the art to recognize that Sawhney compares the two alpha values for all points in order to determine which points are illuminated by the camera, and obviously one may refer cameras in fig. 4 of Sawhney as the optical center in the claimed invention.

Claims 25, and 46.

Sawhney teaches the method of claim 29, wherein the surface comprises a two dimensional surface (e.g., in fig. 5 illustrates 2D surfaces).

Claims 30, 38, and 47.

The method of claim 29, further comprising tracking the position (e.g., see moving objects represented as 3D masks. Only moving people or cars are detected) and orientation information of the at least one image sensor in the environment with respect to the three dimensional model in real-time (e.g., in fig. 10 illustrates a 3D model, see in 3Dchange image that detects moving people and cars). Claims 38 and 47 are rejected with similar reasons as set forth in claim 30, above.

Claims 31, 39, and 48.

The method of claim 30, wherein obtaining a three dimensional model of a three dimensional environment comprises generating the three dimensional model of the three dimensional

environment (e.g., in fig. 8 illustrates a 3D model, see (d)). Claims 48, and 39 are rejected with similar reasons as set forth in claim 31, above.

Claim 33.

The system of claim 37, wherein the surface comprises a two dimensional surface (e.g., under section 2 at third paragraph teaches the 2D surface).

Claim 37.

Claim 37 is rejected with similar reasons as set forth in claim 29, above.

Regarding new claims 41-44, wherein identifying a foreground object comprises identifying the foreground object in the subtracted real-time video imagery information using a histogram-based threshold and a noise filter (e.g., on page 164 at the right col. teaches the absolute value at each point can then be computed, and the result can be thresholded in order to highlight intensity or feature differences between the current video image and the reference image, on page 160 in fig. 3 clearly illustrates final rendered composite that has been filtered the video pixels, and Sawhney does not disclose "a noise filter" Examiner interpretation: the noise filter may be considered as a virtual camera view in fig. 3 (must be seen in color image) that shows just the video pixels); wherein identifying a region in motion in real time further comprises estimating the background image by modeling the background image as a temporal pixel average of five recent image frames in the real-time video imagery information (e.g., on page 164 at right col. teaches the reference background image needs to be constantly updated during the day to reflect changing ambient illumination. Alternatively only moving objects may

be detected by comparing current image with an image taken a few seconds before. The 2D moving object detection can be done in real time).

Sawhney does not explicitly specify (*see the underlined sections*) identifying a region in motion in real time by modeling the background image as a temporal pixel average of five recent image frames in the real time video imagery. However, Examiner takes an official notice for an average of five recent frames, because Sawhney on page 161 under "A pseudo-code for the rendering algorithm .." teaches as one of the parameters that a user may be indicated a number for number of frames "frame number", and that number may be 5 image frames, also on page 164 at the bottom of first paragraph left column i.e. comparing current image with an image taken a few seconds before. The 2D moving object detection can be done in real time.

It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute applicant 's described structure, material, or acts for that described in the Sawhney's system/method, in order to take advantage of the Video Flashlight system that is the real-time rendering of multiple live videos overlaid precisely on a 3D model.

Claim 45 is rejected with similar reasons as set forth in claim 29, above, except the preamble of claim 45 contains "a machine-readable medium ....", see rejection under 112.

Claims 49-50 are rejected with similar reasons as set forth in claims 41-42, above.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 45-50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention. the preamble of claims 45-50 contain "machine-readable medium ..." that renders the claims indefinite, because the machine-readable medium is not well established whether is a camera, a computer or an optical device. The limitation of "medium" is not explicitly defined whether is a storage device, or a signal, or etc.

Claims 46-50 are contained similar limitations as set forth in claim 45, therefore they are rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAVID A. AMINI whose telephone number is (571)272-7654. The examiner can normally be reached on 8-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on 571-272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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